

**MEMORANDUM**

TO: File

FROM: David W. Filipiak, P.E.  
Senior Associate  
Robert J. Leba  
Engineer

DATE: November 29, 2000

SUBJECT: STORM WATER MANAGEMENT PLAN FOR LRT YARDS AND SHOPS

**PURPOSE:**

The purpose of this memorandum is to develop a Storm Water Management Plan for the LRT development site. This involves identifying existing and proposed drainage areas, computing their discharge rates, and developing mitigation for water quality and quantity.

**CRITERIA**

Water Quality City of Minneapolis Stormwater Ordinance

- 70% Total Suspended Solids (TSS) removal (Interim Discharge Standards to Mississippi River)
- MPCA Best Management Practices

Water Quantity Limit rate of discharge to existing rates or to an acceptable level for downstream conveyance system.

**ANALYSIS****HYDROLOGY****EXISTING SITE (FIGURE 1)**

	Area (ac)	C	Tc (min)	Q <sub>10</sub> (cfs)
Area 1	6.5	0.45	30	10
Area 2	8.2	0.45	30	13
Area 3	5.2	0.60	10	17
Area 4	4.9	0.50	15	12

**PROPOSED SITE (FIGURE 2)**

	Area	C	Tc	Q <sub>10 - in</sub> (cfs)	Q <sub>10 - out</sub> (cfs)
Area A (1,2,3)	19.9	0.50	20	42	17
Area B (4)	4.9	0.50	15	12	12

**PROPOSED MITIGATION**Water Quality:

Area A Wet pond with permanent pool volume  $\geq$  Runoff from the 2" storm event (0.93 ac-ft)<sup>(1)</sup>

Area B Grit chamber<sup>(2)</sup>

Water Quantity:

Area A Pond discharge  $\leq$  17 cfs (Requires 1.3 ac-ft of active pond storage to attenuate inflow)

Area B No mitigation required (no runoff increase)

**CONCLUSIONS**

- Drainage of Area A is directed to a wet detention basin for water quality treatment and attenuation to match the existing discharge rate. The pond will discharge to the existing storm sewer located on Cedar Avenue<sup>(3)</sup>. The existing storm sewer in Cedar Avenue appears adequate for this discharge.
- Normal water level (NWL) is approximate and may be adjusted once a site grading plan is prepared.
- Drainage area B is directed to a grit chamber for water quality treatment. No attenuation is necessary because the runoff in the proposed condition will not increase substantially. The discharge is directed to the existing storm sewer located on 15th Avenue.

<sup>(1)</sup>Expected removal efficiency of 80 to 90% TSS

<sup>(2)</sup>Expected removal efficiency of 40 to 50% TSS

<sup>(3)</sup>Alternate connection to a drop shaft connected to a 6 x 6 storm drain tunnel located on the north end of the building



MINNEAPOLIS LRT YARDS AND SHOPS  
MITIGATION STUDY

**EXISTING DRAINAGE AREA MAP**

FIGURE 1  
OF 2



SRF Consulting Group, Inc.  
PLANNING AND DESIGN  
DATE: 11-21-06



LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- DRAINAGE BOUNDARIES

POND TYPICAL SECTION

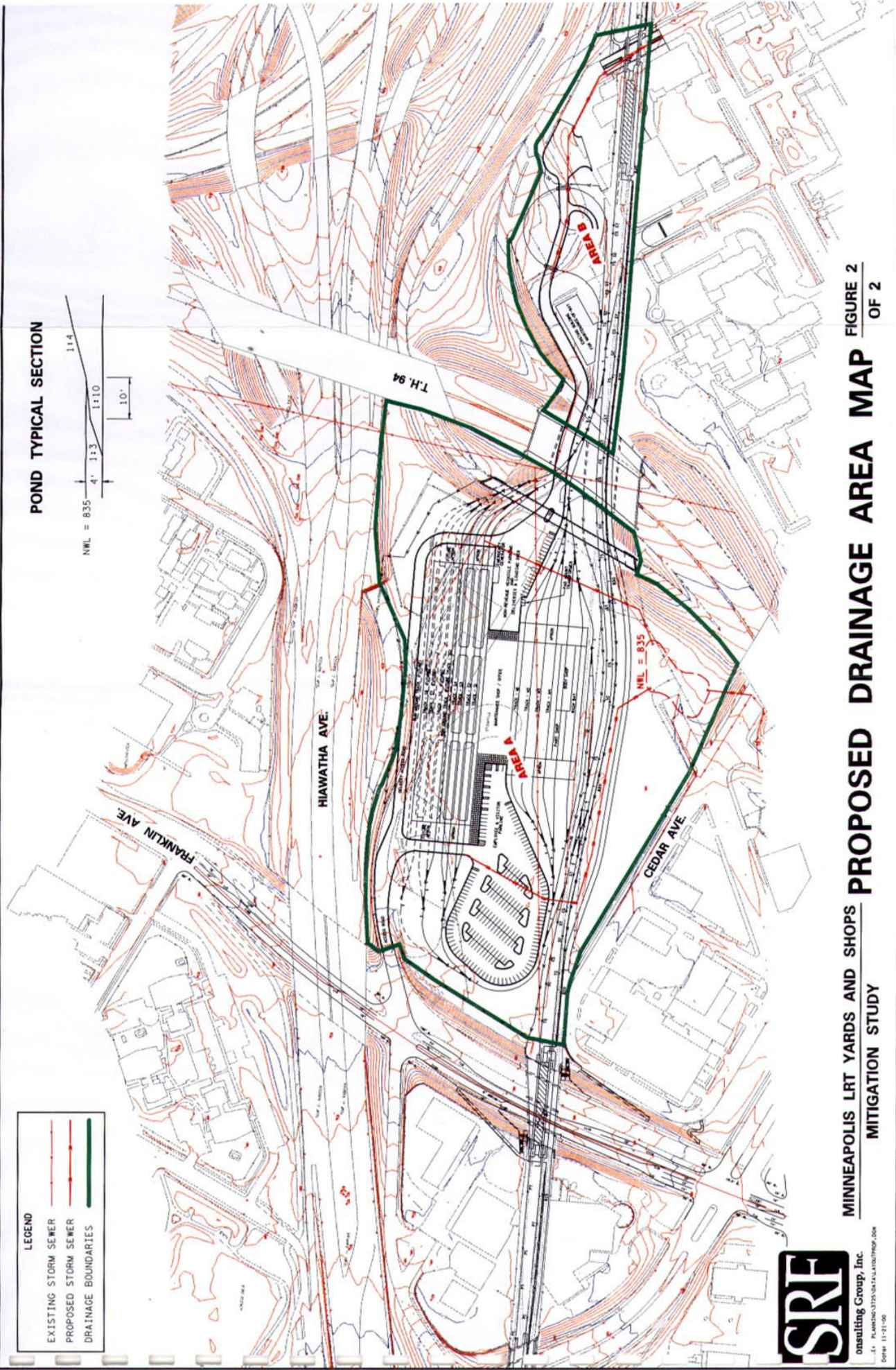
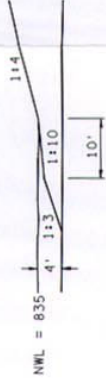


FIGURE 2  
OF 2

PROPOSED DRAINAGE AREA MAP

MINNEAPOLIS LRT YARDS AND SHOPS  
MITIGATION STUDY



Consulting Group, Inc.  
111 PLUMBERSVILLE AVENUE, SUITE 200  
DUBLIN, OH 43017-1111  
Date: 11-21-00